



SEQUENCE LISTING

<110> AFEYAN, NOUBAR B.
LEE, FRANK D.
WONG, GORDON G.
DAS GUPTA, RUCHIRA
BAYNES, BRIAN

<120> ADZYMES AND USES THEREOF

<130> COTH-P01-001

<140> 10/650,592

<141> 2003-08-27

<150> 60/406,517

<151> 2002-08-27

<150> 60/423,754

<151> 2002-11-05

<150> 60/430,001

<151> 2002-11-27

<160> 45

<170> PatentIn version 3.5

<210> 1

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 1

Glu Glu Thr Ala Arg Phe Gln Pro Gly Tyr Arg Ser
1 5 10

<210> 2

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 2

Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu
1 5 10

<210> 3

<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 3
Asp Tyr Lys Asp Asp Lys
1 5

<210> 4
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 4
Tyr Pro Tyr Asp Val Pro Asp Tyr Ala
1 5

<210> 5
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 5
Glu Asp Gln Val Asp Pro Arg Leu Ile Asp Gly Lys
1 5 10

<210> 6
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 6
Tyr Thr Asp Ile Glu Met Asn Arg Leu Gly Lys
1 5 10

<210> 7
<211> 5

<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 7
Ser Ser Ser Ser Gly
1 5

<210> 8
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 8
Ser Gly Gly Gly Gly
1 5

<210> 9
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<220>
<221> MOD_RES
<222> (3)..(4)
<223> Any amino acid

<400> 9
His Glu Xaa Xaa His
1 5

<210> 10
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
6x His tag

<400> 10
His His His His His His

1

5

<210> 11

<211> 26

<212> PRT

<213> Human immunodeficiency virus 1

<400> 11

Cys Phe Ile Thr Lys Ala Leu Gly Ile Ser Tyr Gly Arg Lys Lys Arg
1 5 10 15

Arg Gln Arg Arg Arg Pro Pro Gln Gly Ser
20 25

<210> 12

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 12

Cys Met His Ile Glu Ser Leu Asp Ser Tyr Thr Cys
1 5 10

<210> 13

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 13

Cys Met Tyr Ile Glu Ala Leu Asp Lys Tyr Ala Cys
1 5 10

<210> 14

<211> 32

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<220>

<221> MOD_RES

<222> (1)..(1)
<223> A unique residue, such as cysteine or lysine, that facilitates chemical conjugation of the internalizing peptide to a targeting protein conjugate

<220>
<221> MOD_RES
<222> (2)..(3)
<223> Any residues selected to modulate the affinity of the internalizing peptide for different membranes

<220>
<223> see specification as filed for detailed description of substitutions and preferred embodiments

<400> 14
Xaa Xaa Xaa Glu Ala Ala Leu Ala Glu Ala Leu Ala Glu Ala Leu Ala
1 5 10 15

Glu Ala Leu Ala Glu Ala Leu Ala Glu Ala Leu Glu Ala Leu Ala Ala
20 25 30

<210> 15
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 15
Ala Leu Trp His Trp Trp His
1 5

<210> 16
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<220>
<221> MOD_RES
<222> (1)..(1)
<223> Thr or Ser

<400> 16
Xaa Trp Leu His Trp Trp Ala
1 5

<210> 17
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 17
Gly Gly Gly Gly Ser
1 5

<210> 18
<211> 6
<212> PRT
<213> Influenza A virus

<400> 18
Asp Val Pro Asp Tyr Ala
1 5

<210> 19
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 19
Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
1 5 10 15

<210> 20
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 20
Gly Gly Val Arg
1

<210> 21
<211> 639
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 21

Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro
1 5 10 15

Gly Ser Thr Gly Asp Ala Ala Gln Pro Ala Arg Arg Ala Val Arg Ser
20 25 30

Leu Met Thr Ala Thr Ser Glu Tyr Gln Thr Phe Phe Asn Pro Arg Thr
35 40 45

Phe Gly Ser Gly Glu Ala Asp Cys Gly Leu Arg Pro Leu Phe Glu Lys
50 55 60

Lys Ser Leu Glu Asp Lys Thr Glu Arg Glu Leu Leu Glu Ser Tyr Ile
65 70 75 80

Asp Gly Arg Ile Val Glu Gly Ser Asp Ala Glu Ile Gly Met Ser Pro
85 90 95

Trp Gln Val Met Leu Phe Arg Lys Ser Pro Gln Glu Leu Leu Cys Gly
100 105 110

Ala Ser Leu Ile Ser Asp Arg Trp Val Leu Thr Ala Ala His Cys Leu
115 120 125

Leu Tyr Pro Pro Trp Asp Lys Asn Phe Thr Glu Asn Asp Leu Leu Val
130 135 140

Arg Ile Gly Lys His Ser Arg Thr Arg Tyr Glu Arg Asn Ile Glu Lys
145 150 155 160

Ile Ser Met Leu Glu Lys Ile Tyr Ile His Pro Arg Tyr Asn Trp Arg
165 170 175

Glu Asn Leu Asp Arg Asp Ile Ala Leu Met Lys Leu Lys Lys Pro Val
180 185 190

Ala Phe Ser Asp Tyr Ile His Pro Val Cys Leu Pro Asp Arg Glu Thr
195 200 205

Ala Ala Ser Leu Leu Gln Ala Gly Tyr Lys Gly Arg Val Thr Gly Trp
210 215 220

Gly Asn Leu Lys Glu Thr Trp Thr Ala Asn Val Gly Lys Gly Gln Pro
225 230 235 240

Ser Val Leu Gln Val Val Asn Leu Pro Ile Val Glu Arg Pro Val Cys
245 250 255

Lys Asp Ser Thr Arg Ile Arg Ile Thr Asp Asn Met Phe Cys Ala Gly
260 265 270

Tyr Lys Pro Asp Glu Gly Lys Arg Gly Asp Ala Cys Glu Gly Asp Ser
275 280 285

Gly Gly Pro Phe Val Met Lys Ser Pro Phe Asn Asn Arg Trp Tyr Gln
290 295 300

Met Gly Ile Val Ser Trp Gly Glu Gly Cys Asp Arg Asp Gly Lys Tyr
305 310 315 320

Gly Phe Tyr Thr His Val Phe Arg Leu Lys Lys Trp Ile Gln Lys Val
325 330 335

Ile Asp Gln Phe Gly Glu Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
340 345 350

Gly Gly Gly Gly Ser Met Glu Val Gln Leu Leu Glu Ser Gly Gly Asp
355 360 365

Leu Val Lys Pro Gly Gly Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly
370 375 380

Phe Thr Phe Ser Thr Tyr Gly Met Ser Trp Val Arg Gln Thr Pro Asp
385 390 395 400

Lys Arg Leu Glu Trp Val Ala Thr Ile Ser Asn Gly Gly Gly Tyr Thr
405 410 415

Tyr Tyr Pro Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn
420 425 430

Ala Lys Asn Thr Leu Tyr Leu Gln Met Ser Ser Leu Lys Ser Glu Asp
435 440 445

Thr Ala Met Tyr Tyr Cys Ala Arg Arg Glu Arg Tyr Asp Glu Asn Gly
450 455 460

Phe Ala Tyr Trp Gly Arg Gly Thr Leu Val Thr Val Ser Ala Gly Gly
465 470 475 480

Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Asp Ile Val
485 490 495

Met Ser Gln Ser Pro Ser Ser Leu Ala Val Ser Val Gly Glu Lys Ile
500 505 510

Thr Met Ser Cys Lys Ser Ser Gln Ser Leu Phe Asn Ser Gly Lys Gln
515 520 525

Lys Asn Tyr Leu Thr Trp Tyr Gln Gln Lys Pro Gly Gln Ser Pro Lys
530 535 540

Leu Leu Ile Tyr Trp Ala Ser Thr Arg Glu Ser Gly Val Pro Asp Arg
545 550 555 560

Phe Thr Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser
565 570 575

Val Lys Ala Glu Asp Leu Ala Val Tyr Tyr Cys Gln Asn Asp Tyr Ser
580 585 590

His Pro Leu Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg Ala
595 600 605

Asp Ala Ala Pro Thr Ala Arg Gly Gly Pro Glu Gln Lys Leu Ile Ser
610 615 620

Glu Glu Asp Leu Asn Ser Ala Val Asp His His His His His His
625 630 635

<210> 22

<211> 639

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 22

Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro
1 5 10 15

Gly Ser Thr Gly Asp Ala Ala Gln Pro Ala Arg Arg Ala Val Arg Ser
20 25 30

Leu Met Glu Val Gln Leu Leu Glu Ser Gly Gly Asp Leu Val Lys Pro
35 40 45

Gly Gly Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser
50 55 60

Thr Tyr Gly Met Ser Trp Val Arg Gln Thr Pro Asp Lys Arg Leu Glu
65 70 75 80

Trp Val Ala Thr Ile Ser Asn Gly Gly Gly Tyr Thr Tyr Tyr Pro Asp
85 90 95

Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Thr
100 105 110

Leu Tyr Leu Gln Met Ser Ser Leu Lys Ser Glu Asp Thr Ala Met Tyr
115 120 125

Tyr Cys Ala Arg Arg Glu Arg Tyr Asp Glu Asn Gly Phe Ala Tyr Trp
130 135 140

Gly Arg Gly Thr Leu Val Thr Val Ser Ala Gly Gly Gly Gly Ser Gly
145 150 155 160

Gly Gly Gly Ser Gly Gly Gly Gly Ser Asp Ile Val Met Ser Gln Ser
165 170 175

Pro Ser Ser Leu Ala Val Ser Val Gly Glu Lys Ile Thr Met Ser Cys
180 185 190

Lys Ser Ser Gln Ser Leu Phe Asn Ser Gly Lys Gln Lys Asn Tyr Leu
195 200 205

Thr Trp Tyr Gln Gln Lys Pro Gly Gln Ser Pro Lys Leu Leu Ile Tyr
210 215 220

Trp Ala Ser Thr Arg Glu Ser Gly Val Pro Asp Arg Phe Thr Gly Ser
225 230 235 240

Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Val Lys Ala Glu
245 250 255

Asp Leu Ala Val Tyr Tyr Cys Gln Asn Asp Tyr Ser His Pro Leu Thr
260 265 270

Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg Ala Asp Ala Ala Pro
275 280 285

Thr Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
290 295 300

Met Thr Ala Thr Ser Glu Tyr Gln Thr Phe Phe Asn Pro Arg Thr Phe
305 310 315 320

Gly Ser Gly Glu Ala Asp Cys Gly Leu Arg Pro Leu Phe Glu Lys Lys
325 330 335

Ser Leu Glu Asp Lys Thr Glu Arg Glu Leu Leu Glu Ser Tyr Ile Asp
340 345 350

Gly Arg Ile Val Glu Gly Ser Asp Ala Glu Ile Gly Met Ser Pro Trp
355 360 365

Gln Val Met Leu Phe Arg Lys Ser Pro Gln Glu Leu Leu Cys Gly Ala
370 375 380

Ser Leu Ile Ser Asp Arg Trp Val Leu Thr Ala Ala His Cys Leu Leu
385 390 395 400

Tyr Pro Pro Trp Asp Lys Asn Phe Thr Glu Asn Asp Leu Leu Val Arg
405 410 415

Ile Gly Lys His Ser Arg Thr Arg Tyr Glu Arg Asn Ile Glu Lys Ile
420 425 430

Ser Met Leu Glu Lys Ile Tyr Ile His Pro Arg Tyr Asn Trp Arg Glu

435	440	445															
Asn	Leu	Asp	Arg	Asp	Ile	Ala	Leu	Met	Lys	Leu	Lys	Lys	Pro	Val	Ala		
450						455					460						
Phe	Ser	Asp	Tyr	Ile	His	Pro	Val	Cys	Leu	Pro	Asp	Arg	Glu	Thr	Ala		
465					470					475					480		
Ala	Ser	Leu	Leu	Gln	Ala	Gly	Tyr	Lys	Gly	Arg	Val	Thr	Gly	Trp	Gly		
				485					490					495			
Asn	Leu	Lys	Glu	Thr	Trp	Thr	Ala	Asn	Val	Gly	Lys	Gly	Gln	Pro	Ser		
			500					505					510				
Val	Leu	Gln	Val	Val	Asn	Leu	Pro	Ile	Val	Glu	Arg	Pro	Val	Cys	Lys		
		515					520					525					
Asp	Ser	Thr	Arg	Ile	Arg	Ile	Thr	Asp	Asn	Met	Phe	Cys	Ala	Gly	Tyr		
	530					535					540						
Lys	Pro	Asp	Glu	Gly	Lys	Arg	Gly	Asp	Ala	Cys	Glu	Gly	Asp	Ser	Gly		
545					550					555					560		
Gly	Pro	Phe	Val	Met	Lys	Ser	Pro	Phe	Asn	Asn	Arg	Trp	Tyr	Gln	Met		
				565					570					575			
Gly	Ile	Val	Ser	Trp	Gly	Glu	Gly	Cys	Asp	Arg	Asp	Gly	Lys	Tyr	Gly		
			580					585					590				
Phe	Tyr	Thr	His	Val	Phe	Arg	Leu	Lys	Lys	Trp	Ile	Gln	Lys	Val	Ile		
	595						600					605					
Asp	Gln	Phe	Gly	Glu	Ala	Arg	Gly	Gly	Pro	Glu	Gln	Lys	Leu	Ile	Ser		
	610					615					620						
Glu	Glu	Asp	Leu	Asn	Ser	Ala	Val	Asp	His	His	His	His	His	His	His		
625					630				635								

<210> 23

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 23
cccggaagct taatggaggt gcagctgttg 30

<210> 24
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 24
acgcccctcg agcagttggt gcagcatcag c 31

<210> 25
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 25
cccggaagct taatgaccgc caccagtgag tac 33

<210> 26
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 26
ggcccctcga gcctctccaa actgatcaat g 31

<210> 27
<211> 72
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 27
tttggagagg gaggcgggtgg gtctggtggg ggcggtagtg gcggaggtgg gagcatggag 60

gtgcagctgt tg 72

<210> 28
<211> 73
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 28
cacctccatg ctccacctc cgccactacc gccccacca gaccaccgc ctccctctcc 60
aaactgatca atg 73

<210> 29
<211> 75
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 29
gcaccaactg gaggcggtgg gtctggtggg ggcggtagtg gcggaggtgg gagcatgacc 60
gccaccagtg agtac 75

<210> 30
<211> 75
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 30
ggtggcggtc atgctccac ctccgccact accgccccca ccagaccac cgcctccagt 60
tggtgcagca tcagc 75

<210> 31
<211> 33
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 31

Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Gly Ser Gly Ser Ser Gly
1 5 10 15

Ser Gly Ser Ser Gly Ser Gly Ser Ser Gly Ser Gly Ser Gly Gly Val
20 25 30

Arg

<210> 32

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 32

Ile Thr Pro Arg

1

<210> 33

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 33

Ile Thr Leu Arg

1

<210> 34

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 34

Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Gly Ser Gly Asp Tyr Lys Ala
1 5 10 15

Phe Asp

<210> 35
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 35
Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
1 5 10

<210> 36
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 36
Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
1 5 10 15

Gly Gly Gly Ser
20

<210> 37
<211> 30
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 37
Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
1 5 10 15

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
20 25 30

<210> 38
<211> 40
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 38

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
1 5 10 15

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly
20 25 30

Gly Gly Ser Gly Gly Gly Gly Ser
35 40

<210> 39

<211> 50

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 39

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
1 5 10 15

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly
20 25 30

Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly
35 40 45

Gly Ser
50

<210> 40

<211> 280

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 40

Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro
1 5 10 15

Gly Ser Thr Gly Asp Ile Ala Pro Phe Asp Asp Asp Asp Lys Ile Val
20 25 30

Gly Gly Tyr Asn Cys Glu Glu Asn Ser Val Pro Tyr Gln Val Ser Leu
35 40 45

Asn Ser Gly Tyr His Phe Cys Gly Gly Ser Leu Ile Asn Glu Gln Trp
50 55 60

Val Val Ser Ala Gly His Cys Tyr Lys Ser Arg Ile Gln Val Arg Leu
65 70 75 80

Gly Glu His Asn Ile Glu Val Leu Glu Gly Asn Glu Gln Phe Ile Asn
85 90 95

Ala Ala Lys Ile Ile Arg His Pro Gln Tyr Asp Arg Lys Thr Leu Asn
100 105 110

Asn Asp Ile Met Leu Ile Lys Leu Ser Ser Arg Ala Val Ile Asn Ala
115 120 125

Arg Val Ser Thr Ile Ser Leu Pro Thr Ala Pro Pro Ala Thr Gly Thr
130 135 140

Lys Cys Leu Ile Ser Gly Trp Gly Asn Thr Ala Ser Ser Gly Ala Asp
145 150 155 160

Tyr Pro Asp Glu Leu Gln Cys Leu Asp Ala Pro Val Leu Ser Gln Ala
165 170 175

Lys Cys Glu Ala Ser Tyr Pro Gly Lys Ile Thr Ser Asn Met Phe Cys
180 185 190

Val Gly Phe Leu Glu Gly Gly Lys Asp Ser Cys Gln Gly Asp Ser Gly
195 200 205

Gly Pro Val Val Cys Asn Gly Gln Leu Gln Gly Val Val Ser Trp Gly
210 215 220

Asp Gly Cys Ala Gln Lys Asn Lys Pro Gly Val Tyr Thr Lys Val Tyr
225 230 235 240

Asn Tyr Val Lys Trp Ile Lys Asn Thr Ile Ala Ala Asn Ser Thr Arg
245 250 255

Gly Gly Pro Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu Asn Ser Ala
260 265 270

Val Asp His His His His His His
275 280

<210> 41

<211> 461

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 41

Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro
1 5 10 15

Gly Ser Thr Gly Asp Ile Ala Pro Phe Asp Asp Asp Asp Lys Ile Val
20 25 30

Gly Gly Tyr Asn Cys Glu Glu Asn Ser Val Pro Tyr Gln Val Ser Leu
35 40 45

Asn Ser Gly Tyr His Phe Cys Gly Gly Ser Leu Ile Asn Glu Gln Trp
50 55 60

Val Val Ser Ala Gly His Cys Tyr Lys Ser Arg Ile Gln Val Arg Leu
65 70 75 80

Gly Glu His Asn Ile Glu Val Leu Glu Gly Asn Glu Gln Phe Ile Asn
85 90 95

Ala Ala Lys Ile Ile Arg His Pro Gln Tyr Asp Arg Lys Thr Leu Asn
100 105 110

Asn Asp Ile Met Leu Ile Lys Leu Ser Ser Arg Ala Val Ile Asn Ala
115 120 125

Arg Val Ser Thr Ile Ser Leu Pro Thr Ala Pro Pro Ala Thr Gly Thr
130 135 140

Lys Cys Leu Ile Ser Gly Trp Gly Asn Thr Ala Ser Ser Gly Ala Asp
145 150 155 160

Tyr Pro Asp Glu Leu Gln Cys Leu Asp Ala Pro Val Leu Ser Gln Ala
165 170 175

Lys Cys Glu Ala Ser Tyr Pro Gly Lys Ile Thr Ser Asn Met Phe Cys
180 185 190

Val Gly Phe Leu Glu Gly Gly Lys Asp Ser Cys Gln Gly Asp Ser Gly
195 200 205

Gly Pro Val Val Cys Asn Gly Gln Leu Gln Gly Val Val Ser Trp Gly
210 215 220

Asp Gly Cys Ala Gln Lys Asn Lys Pro Gly Val Tyr Thr Lys Val Tyr
225 230 235 240

Asn Tyr Val Lys Trp Ile Lys Asn Thr Ile Ala Ala Asn Ser Leu Val
245 250 255

Pro His Leu Gly Asp Arg Glu Lys Arg Asp Ser Val Cys Pro Gln Gly
260 265 270

Lys Tyr Ile His Pro Gln Asn Asn Ser Ile Cys Cys Thr Lys Cys His
275 280 285

Lys Gly Thr Tyr Leu Tyr Asn Asp Cys Pro Gly Pro Gly Gln Asp Thr
290 295 300

Asp Cys Arg Glu Cys Glu Ser Gly Ser Phe Thr Ala Ser Glu Asn His
305 310 315 320

Leu Arg His Cys Leu Ser Cys Ser Lys Cys Arg Lys Glu Met Gly Gln
325 330 335

Val Glu Ile Ser Ser Cys Thr Val Asp Arg Asp Thr Val Cys Gly Cys
340 345 350

Arg Lys Asn Gln Tyr Arg His Tyr Trp Ser Glu Asn Leu Phe Gln Cys
355 360 365

Phe Asn Cys Ser Leu Cys Leu Asn Gly Thr Val His Leu Ser Cys Gln
370 375 380

Glu Lys Gln Asn Thr Val Cys Thr Cys His Ala Gly Phe Phe Leu Arg
385 390 395 400

Glu Asn Glu Cys Val Ser Cys Ser Asn Cys Lys Lys Ser Leu Glu Cys
405 410 415

Thr Lys Leu Cys Leu Pro Gln Ile Glu Asn Val Lys Gly Thr Glu Asp
420 425 430

Ser Gly Thr Thr Arg Gly Gly Pro Glu Gln Lys Leu Ile Ser Glu Glu
435 440 445

Asp Leu Asn Ser Ala Val Asp His His His His His His
450 455 460

<210> 42

<211> 464

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 42

Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro
1 5 10 15

Gly Ser Thr Gly Asp Ile Ala Pro Phe Asp Asp Asp Asp Lys Ile Val
20 25 30

Gly Gly Tyr Asn Cys Glu Glu Asn Ser Val Pro Tyr Gln Val Ser Leu
35 40 45

Asn Ser Gly Tyr His Phe Cys Gly Gly Ser Leu Ile Asn Glu Gln Trp
50 55 60

Val Val Ser Ala Gly His Cys Tyr Lys Ser Arg Ile Gln Val Arg Leu
65 70 75 80

Gly Glu His Asn Ile Glu Val Leu Glu Gly Asn Glu Gln Phe Ile Asn
85 90 95

Ala Ala Lys Ile Ile Arg His Pro Gln Tyr Asp Arg Lys Thr Leu Asn
100 105 110

Asn Asp Ile Met Leu Ile Lys Leu Ser Ser Arg Ala Val Ile Asn Ala
115 120 125

Arg Val Ser Thr Ile Ser Leu Pro Thr Ala Pro Pro Ala Thr Gly Thr
130 135 140

Lys Cys Leu Ile Ser Gly Trp Gly Asn Thr Ala Ser Ser Gly Ala Asp
145 150 155 160

Tyr Pro Asp Glu Leu Gln Cys Leu Asp Ala Pro Val Leu Ser Gln Ala
165 170 175

Lys Cys Glu Ala Ser Tyr Pro Gly Lys Ile Thr Ser Asn Met Phe Cys
180 185 190

Val Gly Phe Leu Glu Gly Gly Lys Asp Ser Cys Gln Gly Asp Ser Gly
195 200 205

Gly Pro Val Val Cys Asn Gly Gln Leu Gln Gly Val Val Ser Trp Gly
210 215 220

Asp Gly Cys Ala Gln Lys Asn Lys Pro Gly Val Tyr Thr Lys Val Tyr
225 230 235 240

Asn Tyr Val Lys Trp Ile Lys Asn Thr Ile Ala Ala Asn Ser Ala Ala
245 250 255

Ala Leu Val Pro His Leu Gly Asp Arg Glu Lys Arg Asp Ser Val Cys
260 265 270

Pro Gln Gly Lys Tyr Ile His Pro Gln Asn Asn Ser Ile Cys Cys Thr
275 280 285

Lys Cys His Lys Gly Thr Tyr Leu Tyr Asn Asp Cys Pro Gly Pro Gly
290 295 300

Gln Asp Thr Asp Cys Arg Glu Cys Glu Ser Gly Ser Phe Thr Ala Ser
305 310 315 320

Glu Asn His Leu Arg His Cys Leu Ser Cys Ser Lys Cys Arg Lys Glu
325 330 335

Met Gly Gln Val Glu Ile Ser Ser Cys Thr Val Asp Arg Asp Thr Val
340 345 350

Cys Gly Cys Arg Lys Asn Gln Tyr Arg His Tyr Trp Ser Glu Asn Leu
355 360 365

Phe Gln Cys Phe Asn Cys Ser Leu Cys Leu Asn Gly Thr Val His Leu
370 375 380

Ser Cys Gln Glu Lys Gln Asn Thr Val Cys Thr Cys His Ala Gly Phe
385 390 395 400

Phe Leu Arg Glu Asn Glu Cys Val Ser Cys Ser Asn Cys Lys Lys Ser
405 410 415

Leu Glu Cys Thr Lys Leu Cys Leu Pro Gln Ile Glu Asn Val Lys Gly
420 425 430

Thr Glu Asp Ser Gly Thr Thr Arg Gly Gly Pro Glu Gln Lys Leu Ile
435 440 445

Ser Glu Glu Asp Leu Asn Ser Ala Val Asp His His His His His His
450 455 460

<210> 43

<211> 485

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 43

Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro
1 5 10 15

Gly Ser Thr Gly Asp Ile Ala Pro Phe Asp Asp Asp Asp Lys Ile Val
20 25 30

Gly Gly Tyr Asn Cys Glu Glu Asn Ser Val Pro Tyr Gln Val Ser Leu
35 40 45

Asn Ser Gly Tyr His Phe Cys Gly Gly Ser Leu Ile Asn Glu Gln Trp
50 55 60

Val Val Ser Ala Gly His Cys Tyr Lys Ser Arg Ile Gln Val Arg Leu
65 70 75 80

Gly Glu His Asn Ile Glu Val Leu Glu Gly Asn Glu Gln Phe Ile Asn
85 90 95

Ala Ala Lys Ile Ile Arg His Pro Gln Tyr Asp Arg Lys Thr Leu Asn
100 105 110

Asn Asp Ile Met Leu Ile Lys Leu Ser Ser Arg Ala Val Ile Asn Ala
115 120 125

Arg Val Ser Thr Ile Ser Leu Pro Thr Ala Pro Pro Ala Thr Gly Thr
130 135 140

Lys Cys Leu Ile Ser Gly Trp Gly Asn Thr Ala Ser Ser Gly Ala Asp
145 150 155 160

Tyr Pro Asp Glu Leu Gln Cys Leu Asp Ala Pro Val Leu Ser Gln Ala
165 170 175

Lys Cys Glu Ala Ser Tyr Pro Gly Lys Ile Thr Ser Asn Met Phe Cys
180 185 190

Val Gly Phe Leu Glu Gly Gly Lys Asp Ser Cys Gln Gly Asp Ser Gly
195 200 205

Gly Pro Val Val Cys Asn Gly Gln Leu Gln Gly Val Val Ser Trp Gly
210 215 220

Asp Gly Cys Ala Gln Lys Asn Lys Pro Gly Val Tyr Thr Lys Val Tyr
225 230 235 240

Asn Tyr Val Lys Trp Ile Lys Asn Thr Ile Ala Ala Asn Ser Ala Ala
245 250 255

Ala Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
260 265 270

Gly Gly Gly Gly Ser Arg Leu Val Pro His Leu Gly Asp Arg Glu Lys
275 280 285

Arg Asp Ser Val Cys Pro Gln Gly Lys Tyr Ile His Pro Gln Asn Asn
290 295 300

Ser Ile Cys Cys Thr Lys Cys His Lys Gly Thr Tyr Leu Tyr Asn Asp
305 310 315 320

Cys Pro Gly Pro Gly Gln Asp Thr Asp Cys Arg Glu Cys Glu Ser Gly
325 330 335

Ser Phe Thr Ala Ser Glu Asn His Leu Arg His Cys Leu Ser Cys Ser
340 345 350

Lys Cys Arg Lys Glu Met Gly Gln Val Glu Ile Ser Ser Cys Thr Val
355 360 365

Asp Arg Asp Thr Val Cys Gly Cys Arg Lys Asn Gln Tyr Arg His Tyr
370 375 380

Trp Ser Glu Asn Leu Phe Gln Cys Phe Asn Cys Ser Leu Cys Leu Asn
385 390 395 400

Gly Thr Val His Leu Ser Cys Gln Glu Lys Gln Asn Thr Val Cys Thr
405 410 415

Cys His Ala Gly Phe Phe Leu Arg Glu Asn Glu Cys Val Ser Cys Ser
420 425 430

Asn Cys Lys Lys Ser Leu Glu Cys Thr Lys Leu Cys Leu Pro Gln Ile
435 440 445

Glu Asn Val Lys Gly Thr Glu Asp Ser Gly Thr Thr Arg Gly Gly Pro
450 455 460

Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu Asn Ser Ala Val Asp His
465 470 475 480

His His His His His
485

<211> 239
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
polypeptide

<400> 44

Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro
1 5 10 15

Gly Ser Thr Gly Asp Ala Ala Gln Pro Ala Arg Arg Ala Val Arg Ser
20 25 30

Leu Val Pro His Leu Gly Asp Arg Glu Lys Arg Asp Ser Val Cys Pro
35 40 45

Gln Gly Lys Tyr Ile His Pro Gln Asn Asn Ser Ile Cys Cys Thr Lys
50 55 60

Cys His Lys Gly Thr Tyr Leu Tyr Asn Asp Cys Pro Gly Pro Gly Gln
65 70 75 80

Asp Thr Asp Cys Arg Glu Cys Glu Ser Gly Ser Phe Thr Ala Ser Glu
85 90 95

Asn His Leu Arg His Cys Leu Ser Cys Ser Lys Cys Arg Lys Glu Met
100 105 110

Gly Gln Val Glu Ile Ser Ser Cys Thr Val Asp Arg Asp Thr Val Cys
115 120 125

Gly Cys Arg Lys Asn Gln Tyr Arg His Tyr Trp Ser Glu Asn Leu Phe
130 135 140

Gln Cys Phe Asn Cys Ser Leu Cys Leu Asn Gly Thr Val His Leu Ser
145 150 155 160

Cys Gln Glu Lys Gln Asn Thr Val Cys Thr Cys His Ala Gly Phe Phe
165 170 175

Leu Arg Glu Asn Glu Cys Val Ser Cys Ser Asn Cys Lys Lys Ser Leu
180 185 190

Glu Cys Thr Lys Leu Cys Leu Pro Gln Ile Glu Asn Val Lys Gly Thr
195 200 205

Glu Asp Ser Gly Thr Thr Arg Gly Gly Pro Glu Gln Lys Leu Ile Ser
210 215 220

Glu Glu Asp Leu Asn Ser Ala Val Asp His His His His His His
225 230 235

<210> 45

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 45

Arg Pro Leu Ala Leu Trp Arg Ser
1 5